
संपीड़ित वायु संस्थापन के लिए वायु प्रापक
— विशिष्टि
(पहला पुनरीक्षण)

**Air Receivers for Compressed Air
Installation — Specification**
(*First Revision*)

ICS 23.140

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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Compressor, Blowers and Exhausters Sectional Committee had been approved by the Mechanical Engineering Division Council.

This Indian Standard was first published in 1976. The first revision has been taken up to keep pace with the latest technological developments and international practices. In this revision following major changes have been made:

- a) The scope of the standard has been modified to include air receivers having design pressure up to 25 bar;
- b) A new clause mentioning the material to be used for the construction of the air receiver has been added;
- c) A new clause for mounting pressure and temperature transmitter has been added;
- d) A reference clause has been added mentioning the latest version of all the referred standards; and
- e) Clauses **3.1**, **5.1**, **11.1**, **11.2** and **14.2** have been modified.

In the revision of this standard, considerable assistance has been obtained from the leading manufacturers and users in this country.

The composition of the Committee responsible for the formulation of this standard is listed in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the Specified value in this standard.

Indian Standard
AIR RECEIVERS FOR
COMPRESSED AIR INSTALLATION — SPECIFICATION
(First Revision)

1 SCOPE

This standard provides general guidance on air receivers for compressed air installations, where design pressure does not exceed 25 bar.

2 REFERENCES

The standards listed below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
IS 2002 : 2009	Steel plate for pressure vessel for intermediate and high temperature service including boilers (<i>third revision</i>)
IS 2825 : 1969	Code for unfired pressure vessels
IS 3624 : 1987	Specification for pressure and vacuum gauges (<i>second revision</i>)

3 DEFINITION**3.1 Air Receiver**

Any fusion-welded vessel intended to contain air or inert gas above atmospheric pressure but not exceeding 25 bar.

4 GENERAL REQUIREMENTS

4.1 Air receivers help to dampen out pulsations due to reciprocating actions and shall help to condense and trap, as much as possible the moisture in the compressed air, and also to let oil and other impurities settle down before air passes into the piping.

4.2 Air receiver shall provide a 'flywheel effect', that is, it shall meet the varying demands without compressor regulation functioning incessantly. Air receivers are, therefore, also used for the storage of air.

5 LOCATION

5.1 In order to obtain as much cooling effect as possible the receiver shall preferably be installed outdoors or in an open shed. The receiver shall preferably be installed in a vertical position for easy drainage of condensate, either with skirt support or leg supports.

5.1.1 In a long distribution line it pays to install one or more receivers farther on in the system or at a point of intermittent heavy demand.

6 SIZE

6.1 The capacity of the receiver shall be one-tenth of the free air delivery per minute of the compressor, increasing with smaller compressors to about one-sixth. This should be regarded as a minimum. A much bigger capacity shall be needed to provide any appreciable storage of air. This is not applicable to portable compressors. In the case of rotary compressors, a receiver of this capacity shall be in addition to the receiver forming part of the compressor design.

6.1.1 If the air receiver is also to be used for the storage of air, the following formula may be used for determining its size:

$$T = \frac{V (P_1 - P_2)}{C \times P_0}$$

where

- T = time in hours for which receiver supplies air from upper to lower pressure limits;
- V = volume of receiver in m³;
- P_0 = atmospheric pressure in bar;
- P_1 = maximum pressure, absolute in the bar (compressor discharge pressure);
- P_2 = minimum receiver pressure, absolute in the bar (pressure required to operate tool); and
- C = amount of free air drawn per hour in m³ (from the study of the local cycle).

7 MATERIAL

The material of construction of the air receivers shall be as per IS 2825.

8 MANUFACTURE

Air receivers shall be manufactured according to IS 2825 but the design pressure shall be assumed as maximum working pressure plus 10 percent. Receivers up to a pressure of 3.5 bar shall be regarded as Class III vessels and those with higher pressures as Class II.

9 MOUNTINGS

9.1 Safety Valve

Each air receiver shall be provided with a minimum one safety valve preferably of the direct spring-loaded type and shall be so constructed and adjusted as to permit the air to escape from the air receiver without increasing the pressure beyond 10 percent above the working pressure when the air compressor or compressors are giving full output and all outlets other than safety valve or valves are closed.

9.1.1 Safety valves shall be fitted with hand lifting gear. It shall be possible to lift the valve spindle at a pressure not less than 75 percent of working pressures.

9.1.2 Safety valves shall be fitted with a protecting cap or ferrule under the adjusting screw so that they cannot be inadvertently overloaded beyond the pressure at which they have been adjusted.

9.2 Drain Valve

A drain valve or cock shall be provided either for manual or automatic operation, at a point for enabling the draining of the condensate.

9.3 Pressure Gauge

9.3.1 A pressure gauge shall be fitted to each receiver. The bourdon type of gauge conforming to IS 3624 is recommended. The dial shall be graduated in the bar and the graduation shall be from zero to not less than one-and-half times, and not more than twice the design pressure of the receiver.

9.3.2 Provision for mounting pressure/temperature transmitter shall also be provided as agreed between the manufacturer and purchaser.

9.4 Fusible Plugs

9.4.1 Fusible plugs may be fitted to safeguard the installation in case of an excessive rise in temperature due to fire.

9.4.2 The position of the fusible plug where fitted shall be such that discharge of the plug will not do injury to any person.

10 ACCESS AND INSPECTION OPENINGS

Each air receiver shall be provided with openings for cleaning and inspection. Holes for pipe connection may be used for this, purpose provided they are of sufficient size. The recommended number and size of these access holes are as follows:

<i>Sl No.</i>	<i>Inside Vessel Diameter mm</i>	<i>Opening</i>
(1)	(2)	(3)
i)	Up to 230	Two openings each 30 mm clear bore
ii)	230 to 400	Two openings each 45 mm clear bore
iii)	400 to 600	Two openings each 90 mm circular or two elliptical openings of 90 mm × 70 mm
iv)	600 to 900	One manhole or two elliptical openings of 125 mm × 75 mm and if circular of equivalent area
v)	900 and above	At least one manhole or two elliptical holes of 150 mm × 100 mm and if circular of equivalent area

NOTE — Manholes shall be at least 450 mm diameter if circular or 450 mm × 400 mm if elliptical.

11 INSPECTION AND TESTS

11.1 Inspection

The requirements of inspection shall be as given in IS 2825. Periodic inspection of the air receivers shall be carried out once in every 5 years as per Petroleum and Explosives Safety Organization's (PESO) guidelines.

11.2 Hydrostatic Test

Every receiver shall be tested at the manufacturer's works by hydraulic pressure to 1.5 times the design pressure. While under pressure the air receiver shall

be struck with a hammer on both sides and close to welded seams and a thorough examination made. The pressure shall be maintained for 30 minutes.

12 INSTALLATION

Proper foundation details for the receiver and support shall be provided by the manufacturer.

13 SURFACE TREATMENT

Appropriate surface protection shall be given inside and outside of the air receiver to prevent corrosion.

14 MARKING

14.1 Each vessel shall bear a legible and durable

indication of the following:

- a) Manufacturer's name or identification mark;
- b) Maximum working pressure in bar;
- c) Test pressure in bar;
- d) Specification to which the vessel is manufactured;
- e) Date of test; and
- f) Year of manufacture.

14.2 BIS Certification Marking

The product(s) conforming to the requirements of this Standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed there under, and the product(s) may be marked with the Standard Mark.

ANNEX A
(Foreword)

COMMITTEE COMPOSITION

Compressor, Blowers and Exhausters Sectional Committee, MED 22

<i>Organization</i>	<i>Representative(s)</i>
Bharat Petroleum Corporation Limited, Mumbai	SHRI K. RAVI (<i>Chairperson</i>)
Atlas Copco India Limited, Pune	SHRI VIJAY SHARMA
Automotive Research Association of India, Pune	SHRI PRASAD YADAV SHRI ATUL GAIKWAD (<i>Alternate</i>)
Bharat Heavy Electrical Limited, New Delhi	SHRI S. DURAIRAJ SHRI Y. V. RAMA LAKSHMI (<i>Alternate</i>)
Boldrocchi Indian Private Limited, Gurugram	SHRI NOKESH AGGARWAL SHRI PIYUSH GOEL (<i>Alternate</i>)
Bharat Petroleum Corporation Limited, Mumbai	SHRI KANNAN V. V.
Burckhardt Compression India Private Limited, Noida	SHRI R. S. GUNAJI SHRI A. BHASKAR PRABHUNE (<i>Alternate</i>)
CSIR – National Physical Laboratory, New Delhi	DR RAJESH KUMAR PROF DR M. SINGH (<i>Alternate</i>)
CSIR - National Aerospace Laboratories, Bengaluru	SHRI THENNAVARAJAN S.
Directorate General of Quality Assurance, Ministry of Defense, New Delhi	LT COL DEEPAK SHARMA SHRI U. R. RAJA (<i>Alternate</i>)
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Indian Register of Shipping, Mumbai	SHRI SUNEET DIGIKAR SHRI KARTHIK S. (<i>Alternate</i>)
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Kirloskar Pneumatic Company Limited, Pune	SHRI PRAMOD KUMAR YADAV SHRI AMIT SAXENA (<i>Alternate</i>)
MECON Limited, Ranchi	SHRI SUJOY BANERJEE SHRI A. K. MODI (<i>Alternate</i>)
NTPC Limited, New Delhi	SHRI ANUJ KUMAR SHAHI SHRI DOONDESHWAR V. (<i>Alternate</i>)

<i>Organization</i>	<i>Representative(s)</i>
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Reliance India Limited, Mumbai	SHRI S. K. GARYALI SHRI RANJIT S. MUNDRA (<i>Alternate</i>)
Research Designs and Standards Organization (RDSO), Lucknow	SHRI SATNAM SINGH SHRI VIJAY KUMAR GOEL (<i>Alternate</i>)
TLT Engineering India Private Limited, Indrad	SHRI MUKESH K. JAIN SHRI SANJAY MAKWANA (<i>Alternate</i>)
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Member Secretary
SHRI LOKRAJ MEENA
SCIENTIST 'B'/ASSISTANT DIRECTOR
(MECHANICAL ENGINEERING), BIS

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